In the Claims:

This listing of claims will replace all prior versions and listings of claims in this application.

1 (original). A method of monitoring a patient during administration of at least one therapeutic drug, said method comprising:

administering to the patient at least one therapeutic drug;

exposing at least one sensor to expired gases from the patient;

detecting one or more target markers from the therapeutic drug with said sensor.

2 (original). The method of claim 1 wherein said target marker is the therapeutic drug.

3 (original). The method of claim 1 wherein said target marker is a metabolite of the therapeutic drug indicative of the therapeutic drug.

4 (original). The method of claim 1 wherein said target marker is selected from a group consisting of dimethyl sulfoxide (DMSO), acetaldehyde, acetophenone, trans-Anethole (1-methoxy-4-propenyl benzene) (anise), benzaldehyde (benzoic aldehyde), benzyl alcohol, benzyl cinnamate, cadinene, camphene, camphor, cinnamaldehyde (3-phenylpropenal), garlic, citronellal, cresol, cyclohexane, eucalyptol, and eugenol, eugenyl methyl ether; butyl isobutyrate (n-butyl 2, methyl propanoate) (pineapple); citral (2-trans-3,7-dimethyl-2,6-actadiene-1-al); menthol (1-methyl-4-isopropylcyclohexane-3-ol); and α-Pinene (2,6,6-trimethylbicyclo-(3,1,1)-2-heptene).

5 (original). The method of claim 1 wherein at least one therapeutic drug is administered to the patient orally.

6 (original). The method of claim 1 wherein at least one therapeutic drug is delivered intravenously.

7 (original). The method of claim 1 wherein the detecting step comprises detecting both presence and concentration of the target marker to determine at least one therapeutic drug concentration in blood.

8 (original). The method of claim 7 further comprising assigning a numerical value to the concentration as analyzed upon reaching a level of therapeutic effect of said therapeutic drug in said patient and, thereafter, assigning higher or lower values to the concentration based on its relative changes.

9 (original). The method of claim 8, further comprising monitoring the concentration by monitoring changes in said value and adjusting administration of the therapeutic drug to maintain a desired therapeutic effect.

10 (original). The method of claim 7 further comprising determining an appropriate dosage of at least one therapeutic drug based on the concentration of at least one target marker detected in said expired gases.

11 (original). The method of claim 1 wherein the steps are repeated periodically to monitor pharmacodynamics and pharmacokinetics of at least one therapeutic drug over time.

12 (original). The method of claim 1 wherein at least one therapeutic drug is for depression.

13 (original). The method of claim 1 wherein at least one therapeutic drug is for analgesia.

14 (original). The method of claim 1 wherein at least one therapeutic drug is selected for the treatment of a condition selected from group consisting of rheumatoid arthritis, systemic lupus erythematosus, angina, coronary artery disease, peripheral vascular disease, ulcerative colitis, Crohn's disease, organ rejection, epilepsy, anxiety, degenerative arthritis, vasculitis, and inflammation.

15 (original). The method of claim 1 wherein the detecting is continuous.

16 (original). The method of claim 1 wherein the detecting is periodic.

17 (original). The method of claim 1 wherein at least one therapeutic drug is selected from the group consisting of: α-Hydroxy-Alprazolam; Acecainide (NAPA); Acetaminophen (Tylenol); Acetylmorphine; Acetylsalicylic Acid (as Salicylates); α-hydroxy-alprazolam; Alprazolam (Xanax); Amantadine (Symmetrel); Ambien (Zolpidem); Amikacin (Amikin); Amiodarone (Cordarone); Amitriptyline (Elavil) & Nortriptyline; Amobarbital (Amytal); Anafranil (Clomipramine) & Desmethylclomipramine; Ativan (Lorazepam); Aventyl (Nortriptyline); Benadryl (Dephenhydramine); Benziodiazepines; Benzoylecgonine; Benztropine (Cogentin); Bupivacaine (Marcaine); Bupropion (Wellbutrin) and Hydroxybupropion; Butabarbital (Butisol); Butalbital (Fiorinal) Carbamazepine (Tegretol); Cardizem (Diltiazem); Carisoprodol (Soma) & Meprobamate; and Celexa (Citalopram & Desmethylcitalopram).

18 (original). The method of claim 1 wherein at least one therapeutic drug is selected from the group consisting of: Celontin (Methsuximide) (as desmethylmethsuximide); Centrax (Prazepam) (as Desmethyldiazepam); Chloramphenicol (Chloromycetin); Chlordiazepoxide; Chlorpromazine (Thorazine); Chlorpropamide (Diabinese); Clonazepam (Klonopin); Clorazepate (Tranxene); Clozapine; Cocaethylene; Codeine; Cogentin (Benztropine); Compazine (Prochlorperazine); Cordarone (Amiodarone); Coumadin (Warfarin); Cyclobenzaprine (Flexeril); Cyclosporine (Sandimmune); Cylert (Pemoline); Dalmane (Flurazepam) & Desalkylflurazepam; Darvocet; Darvon (Propoxyphene) & Norpropoxyphene; Demerol (Meperidine) & Normeperidine; Depakene (Valproic Acid); Depakote (Divalproex) (Measured as Valproic Acid); Desipramine (Norpramin); Desmethyldiazepam; Desyrel (Trazodone); Diazepam & Desmethyldiazepam; Diazepam (Valium) Desmethyldiazepam; Dieldrin; Digoxin (Lanoxin); Dilantin (Phenytoin); Disopyramide (Norpace); Dolophine (Methadone); Doriden (Glutethimide); Doxepin (Sinequan) and Desmethyldoxepin; Effexor (Venlafaxine); Ephedrine; Equanil (Meprobamate) Ethanol; Ethosuximide (Zarontin);

Ethotoin (Peganone); Felbamate (Felbatol); Fentanyl (Innovar); Fioricet; Fipronil; Flunitrazepam (Rohypnol); Fluoxetine (Prozac) & Norfluoxetine; Fluphenazine (Prolixin); Fluvoxamine (Luvox); Gabapentin (Neurontin); Gamma-Hydroxybutyric Acid (GHB); Garamycin (Gentamicin); Gentamicin (Garamycin); Halazepam (Paxipam); Halcion (Triazolam); Haldol (Haloperidol); Hydrocodone (Hycodan); Hydroxyzine (Vistaril); Ibuprofen (Advil, Motrin, Nuprin, Rufen); Imipramine (Tofranil) and Desipramine; Inderal (Propranolol); Keppra (Levetiracetam); Ketamine; Lamotrigine (Lamictal); Lanoxin (Digoxin); Lidocaine (Xylocaine); Lindane (Gamma-BHC); Lithium; Lopressor (Metoprolol); Lorazepam (Ativan); and Ludiomil.

19 (original). The method of claim 1 wherein at least one therapeutic drug is selected from the group consisting of: Maprotiline; Mebaral (Mephobarbital) & Phenobarbital; Mellaril (Thioridazine) & Mesoridazine; Mephenytoin (Mesantoin); Meprobamate (Miltown, Equanil); Mesantoin (Mephenytoin); Mesoridazine (Serentil); Methadone; Methotrexate (Mexate); Methsuximide (Celontin) (as desmethsuximide); Mexiletine (Mexitil); Midazolam (Versed); Mirtazapine (Remeron); Mogadone (Nitrazepam); Molindone (Moban); Morphine; Mysoline (Primidone) & Phenobarbital; NAPA & Procainamide (Pronestyl); NAPA (N-Acetyl- Procainamide); Navane (Thiothixene); Nebcin (Tobramycin); Nefazodone (Serzone); Nembutal (Pentobarbital); Nordiazepam; Olanzapine (Zyprexa); Opiates; Orinase (Tolbutamide); Oxazepam (Serax); Oxcarbazepine (Trileptal) as 10-Hydroxyoxcarbazepine; Oxycodone (Percodan); Oxymorphone (Numorphan); Pamelor (Nortriptyline); Paroxetine (Paxil); Paxil (Paroxetine); Paxipam (Halazepam); Pegamone (Ethotoin); PEMA (Phenylethylmalonamide); Pentothal (Thiopental); Perphenazine (Trilafon); Phenergan (Promethazine); Phenothiazine; Phentermine; Phenylglyoxylic Acid; Procainamide (Pronestyl) & NAPA; Promazine (Sparine); Propafenone (Rythmol); Protriptyline (Vivactyl); Pseudoephedrine; Quetiapine (Seroquel); Restoril (Temazepam); Risperdal (Risperidone) and Hydroxyrisperidone; Secobarbital (Seconal); Sertraline (Zoloft) & Desmethylsertraline; Stelazine (Trifluoperazine); Surmontil (Trimipramine); Tocainide (Tonocard); and Topamax (Topiramate).

20 (currently amended). The method of claim 1 wherein said sensor is selected from the group consisting of: metal-insulator-metal ensemple (MIME) sensors, cross-reactive optical microsensor arrays, fluorescent polymer films, surface enhanced raman spectroscopy (SERS), diode lasers, selected ion flow tubes, metal oxide sensors (MOS), bulk acoustic wave (BAW) sensors, colorimetric tubes, infrared spectroscopy, gas chromatography, semiconductive gas sensor technology; mass spectrometers, gluorescent spectrophotometers, conductive polymer gas sensor technology; aptamer sensor technology; or amplifying fluorescent polymer (AFP) sensor technology; ~~or surface acoustic wave gas sensor technology~~.

21 (original). The method of claim 20 wherein the sensor technology produces a unique electronic fingerprint to characterize the detection and concentration of said at least one target marker.

22 (original). The method of claim 1 further comprising the step of recording data from said sensor.

23 (original). The method of claim 1 further comprising the step of transmitting data from said sensor.

24 (original). The method of claim 1 further comprising comparing at least one target marker detected with a predetermined signature profile.

25 (original). The method of claim 1 further comprising capturing a sample of expired gases prior to exposing said sensor to expired gases.

26 (original). The method of claim 1 further comprising dehumidifying expired gases prior to exposing said sensor to expired gases.

27 (original). The method of claim 1 further comprising exposing said sensor to expired gases during exhalation of the patient's breath.

28 (original). The method of claim 1 further comprising assigning a numerical value to the concentration as analyzed upon reaching a level of anesthetic effect in said patient and, thereafter, assigning higher or lower values to the concentration based on its relative changes.

29 (original). The method of claim 1 wherein said sensor is portable.

30 (original). A therapeutic drug delivery and monitoring system for delivering an appropriate dosage of the therapeutic drug to a patient;

at least one therapeutic drug supply having a controller for controlling the amount of therapeutic drug provided by the supply to the patient;

an expired gas sensor for analyzing the patient's breath for the presence and concentration of at least one target marker indicative of therapeutic drug concentrations in the patient's bloodstream, and for sending a signal regarding the concentration of the therapeutic drug in the patient's bloodstream; and

a system controller connected to the therapeutic drug supply, which receives and analyzes the signal from the sensor and controls the amount of therapeutic drug administered to the patient based on the signal.

31 (original). The system of claim 30 wherein the expired gas sensor comprise a sensor for analyzing the gas for concentration of at least one target marker indicative of the therapeutic drug concentration in the patient's bloodstream and a processor for calculating the pharmacodynamic and pharmacokinetic effect of the therapeutic drug based on the concentration of the therapeutic drug.

32 (currently amended). The system of claim 31 wherein the sensor is selected from the group consisting of: metal-insulator-metal ensemple (MIME) sensors, cross-reactive optical microsensor arrays, fluorescent polymer films, surface enhanced raman spectroscopy (SERS), diode lasers, selected ion flow tubes, metal oxide sensors (MOS), bulk acoustic wave (BAW) sensors, colorimetric tubes, infrared spectroscopy, gas chromatography, semiconductive gas sensor technology; mass spectrometers, gluorescent spectrophotometers, conductive polymer gas sensor technology; aptamer sensor technology; or amplifying fluorescent polymer (AFP) sensor technology~~; or surface acoustic wave gas sensor technology~~.

33 (previously presented). The method of claim 1 wherein at least one therapeutic drug is a psychiatric drug.

34 (previously presented). The method, according to claim 33, wherein at least one therapeutic drug is selected from the group consisting of: antidepressants, anti-psychotics, anti-anxiety drugs, and depressants.

35 (previously presented). A method for monitoring endogenous compounds in a patient, comprising:

sampling a patient's expired breath;

analyzing the breath for concentration of endogenous compounds using sensor technology; and

calculating the concentration of endogenous compounds, wherein the endogenous compounds are selected from the group consisting of: hydrocarbons; alcohols; glucose; electrolytes; and oxygenated, chlorinated, and nitrogenated organic chemical compounds.

36 (previously presented). The method of claim 35 wherein the endogenous compounds are selected from the group consisting of: glucose and electrolytes.

37 (previously presented). The method of claim 35 wherein the endogenous compound is glucose.

38 (previously presented). An anesthetic agent delivery system for delivering a desired dose of anesthetic agent to a patient comprising:

an anesthetic supply having a controller for controlling the amount of anesthetic agent provided by the supply;

a breath analyzer for analyzing the patient's breath for concentration of at least one substance indicative of the anesthetic agent concentration in the patient's bloodstream that provides a signal to indicate the anesthetic agent concentration delivered to the patient; and

a system controller connected to the anesthetic supply which receives the signal and controls the amount of anesthetic agent based on the signal.

39 (previously presented). The system of claim 38 wherein the breath analyzer comprises a collector for sampling the patient's expired breath, a sensor for analyzing the breath for concentration of at least one substance indicative of the anesthetic agent concentration, a processor for calculating the effect of the agent based on the concentration and determining depth of anesthesia.

40 (currently amended). The system of claim 39 wherein the sensor is selected from semiconductor gas sensor technology[[,]] or conductive polymer gas sensor technology~~, or surface acoustic wave gas sensor technology~~.

41 (previously presented). An anesthetic agent delivery and monitoring system for delivering balanced anesthesia to a patient through a breathing circuit and an IV comprising:

an anesthetic gas supply having a controller for controlling the amount of volatile anesthetic agent provided by the supply to the breathing circuit;

an intravenous anesthetic agent supply having a controller for controlling the amount of IV anesthetic agent administered to the patient intravenously;

an inspired gas analyzer for analyzing the concentration of anesthetic gas in the breathing circuit;

an expired gas analyzer for analyzing the patient's breath for concentration of at least one substance indicative of anesthetic agent concentrations in the patient's bloodstream that provides at least one signal to indicate the anesthetic agent concentration delivered to the patient; and

a system controller connected to each of the anesthetic supplies which receives the signal and controls the amount of anesthetic agents administered based on the signal.

42 (previously presented). The system of claim 41 wherein the inspired gas analyzer and expired gas analyzer comprise a sensor for analyzing the gas for concentration of at least one substance indicative of the anesthetic agent concentration and a processor for calculating the effect of the agent based on the concentration and determining depth of anesthesia.

43 (currently amended). The system of claim 42 wherein the sensor is selected from semiconductor gas sensor technology[[,]] or conductive polymer gas sensor technology~~, or surface acoustic wave gas sensor technology~~.

44 (previously presented). An apparatus for administering balanced anesthesia to a patient comprising:

at least one supply of at least one intravenous anesthetic agent;

intravenous delivery means for controllably intravenously delivering said at least one intravenous anesthetic agent to the patent;

at least one supply of at least one inhalational anesthetic agent;

a breathing circuit for delivery of said inhalational anesthetic agent;

an inspired gas analyzer for analyzing gas in said breathing circuit for said inhalational agent;

an expired gas analyzer for analyzing the patient's breath for concentration of at least one substance indicative of anesthetic agents in the patient's bloodstream that provides a signal to indicate anesthetic agent concentration delivered to the patient;

a system controller connected to the intravenous delivery means which receives the signal and controls the amount of anesthetic agent based on the signal; and

a system controller connected to the breathing circuit which receives the signal and controls the amount of anesthetic agent based on the signal.